MEMS
Sensors & Actuators

2019 Patenting Activity

July 2020
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SCOPE OF THE REPORT

MEMS devices included in the report

CMOS image sensor
Microbolometers
Micromirrors
Autofocus
Gas sensors (VOC, CO, CO2, NOx …)
Humidity sensors
Microfluidics (micropump, microvalve, etc.)

RF communication (oscillators, tuners, switches, filters)

Inertial sensors (accelero, gyro, IMU, magneto)

Audio

Speech

Pressure

Touch

Force, haptic & touch sensors

Pressure sensors

Microphones
Ultrasonic

Microspeakers

Sight

Balance

Sight

Balance

CMOS image sensor
Micromirrors

Sight

Balance

Autofocus
Gas sensors (VOC, CO, CO2, NOx …)
Humidity sensors
Microfluidics (micropump, microvalve, etc.)
**SCOPE OF THE REPORT**

- This report provides a detailed picture of the **2019 patenting activity for MEMS sensors and actuators**, including inertial sensors (accelero, gyro, IMU), microphones, microspeakers, ultrasonic sensors, pressure sensors, micromirrors, microbolometers, gas sensors. We have selected patents published in 2019 specifically related to **MEMS transducers**, **MEMS devices** and **MEMS packaging**. All other patents related to materials, wafer manufacturing, driver circuits and systems have been excluded.

- This report covers **patents published worldwide** between January 1st 2019 and December 31st 2019. We have selected and analyzed more than **4,300 patents** grouped in more than **3,000 patent families** relevant to the scope of this report.

<table>
<thead>
<tr>
<th>Example of patent</th>
<th>Selected</th>
<th>Not selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patents related to MEMS transducers or actuators and with a first publication date in 2019.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Patents related to sensors or actuators, specifically claiming the use of a MEMS process, and with a first publication date in 2019.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Patents related to material growth/deposition, specially developed for MEMS devices, and with a first publication date in 2019.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Patents relates to MEMS technology with a first publication date prior to 2019.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Patents related to sensors or actuators which do not use MEMS technology.</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
KEY FEATURES OF THE REPORT

✓ The report provides a **global view of the most recent patents published in 2019** by MEMS players, the main **patent applicants**, their IP **collaborations**, an understanding of their **patented technologies** and related R&D developments.

✓ Due to the 12-18 months delay between the patent filing and its publication, the **patents published in 2019** give us information on **R&D activity and innovations** that were developed in 2017-2018.

✓ The report also provides an extensive **Excel database** with all patents analyzed in the report (>4,300 patents), including **application and technology segmentation**. This **useful patent database** allows multi-criteria searches, including dates and numbers of priority/application/publication/grant, title, abstract, claims, patent applicants, current assignees, inventors, hyperlinks to original documents.

**Disclaimer:** This report **does not provide** any insight analyses or counsel regarding **legal aspects** or the **validity** of any individual patent. KNOWMADE is a research firm that provides technical analysis and technical opinions. KNOWMADE is not a law firm. The research, technical analysis and/or work proposed or provided by KNOWMADE and contained herein is not a legal opinion and should not be construed as such.
Identifying the most active IP players of the year
What are the most active patent applicants and what are their current developments
Understanding recent technological development
What are the patented technologies by MEMS devices
Understanding recent technological development

What are the patented technologies by MEMS devices

MEMS Sensors & Actuators: 2019 Patenting Activity | June 2020 | Ref.: KM20005
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This **Excel database** allows multi-criteria searches and includes patent publication number, hyperlinks to the original documents, priority date, abstract, patent assignees, legal status and technical segment for each patent families.

<table>
<thead>
<tr>
<th>Patent information</th>
<th>Segmentation by MEMS devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent numbers, application dates, publication dates, current assignee, inventors, current legal status</td>
<td>Inertial, gyro, accelerometer, microphone, microspeaker, ultrasonic, gas sensor, micromirror, pressure sensor, packaging</td>
</tr>
</tbody>
</table>
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MEMS Sensors & Actuators: 2019 Patenting Activity
Patent Landscape Analysis – July 2020
Ref.: KM20005

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Competitive landscape | Technology trends | Opportunities / Risks | R&D and IP strategy

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- Defend your position in case of licensing/litigation
- Evaluate the risks to infringe patents

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- Understand, anticipate and evaluate the competitive landscape and current technology developments
- Improve your R&D and IP strategy
- Identify and get access to external innovation
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- Batteries & Fuel-cell
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- PV

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